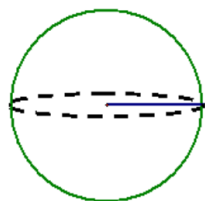
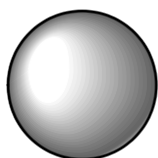


Spheres

Sphere- The set of all points that are a given distance (radius) to a given point (center).



$$A = 4\pi r^2$$

Ex:

$$r = 4\text{cm}$$

$$V = \frac{4}{3} \pi r^3$$

Ex:

$$V = \frac{32000\pi}{3} \text{ cm}^3$$

$$V = \frac{4}{3} \pi r^3$$

$$A = \frac{16000\pi}{3} \text{ cm}^2$$

$$\frac{32000\pi}{3} = \frac{4}{3} \pi r^3$$

$$4\pi(20)^2$$

$$\sqrt[3]{8000} = \sqrt[3]{3^3}$$

$$3 \times \sqrt[3]{8000} = 20$$

Ex:

$$A = 12 \pi \text{ cm}^2$$

$$A = 4\pi r^2$$

$$V = \frac{4\pi\sqrt{3}}{3} \text{ cm}^3$$

$$12\pi = 4\pi r^2$$

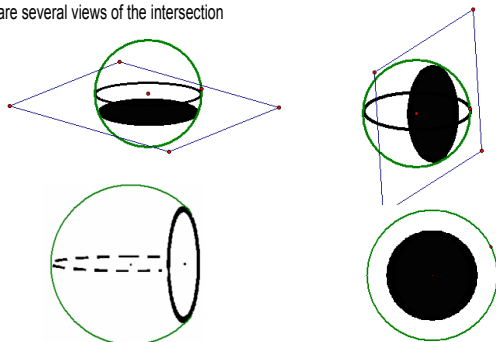
$$\frac{4}{3} \pi (\sqrt{3})^3$$

$$3 = r^2$$

$$\frac{4}{3} \pi \sqrt{3}$$

$$\sqrt{3} = r$$

When a sphere and a plane intersect, the intersection is a circle. Try to imagine slicing an orange what two dimensional shape is left where you cut the slice-a circle. Also, imagine pouring water into sphere (but not filling it) what shape is the surface of the water-a circle. are several views of the intersection

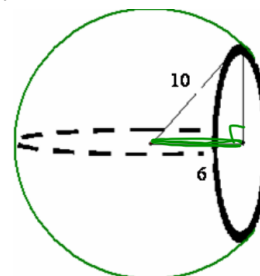


Shown

EX:

A plane intersects a sphere 6 cm from the center of the sphere. The radius of the sphere is 10 cm. What is the area of the circle formed?

Radius of the circle = 8 cm
(Pythagorean thm.)
Area of the circle = $64\pi \text{ cm}^2$

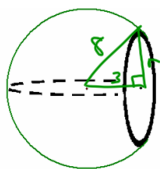


EX:

A plane intersects a sphere 3 cm from the center of the sphere. The radius of the sphere is 8 cm. What is the area of the circle formed?

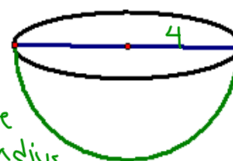
Radius of the circle = $\sqrt{55}$
(Pythagorean thm.)
Area of the circle = $55\pi \text{ cm}^2$

$$\begin{aligned} 8^2 &= 3^2 + r^2 \\ 64 &= 9 + r^2 \\ 55 &= r^2 \\ \sqrt{55} &= r \end{aligned}$$



The great circle occurs when the slice is taken at the hemisphere.

great circle + sphere have same radius



What is the TA of the hemisphere, if the area of the great circle is 16π ?

$$\begin{aligned} \frac{1}{2} A_{\text{sphere}} + A_{\text{great circle}} \\ \frac{1}{2} 4\pi r^2 + 16\pi \\ 2(16\pi) + 16\pi \\ A = 48\pi \text{ cm}^2 \end{aligned}$$

HW

p674-675 10-14, 17, 18,21,24

p 704 9, 10, 13-15